TAB

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SPECIAL ARTICLE

SOVIET SCIENTIFIC AND TECHNICAL MANPOWER

The USSR is training a body of scientists and technicians which is increasing in size and quality and approaching comparability with that of the United States. If present trends continue, the total capabilities of Soviet scientific and technical manpower may exceed those of the United States in the near future.

The Soviet leaders have consistently regarded science and technology as the key to the attainment of their national economic and military goals and have developed nationwide programs for scientific and cultural education which have mobilized large human and material resources.

The vitality of the Soviet program of higher education is apparent in the growth in the number of institutions and students. Since the revolution, these have grown from 91 higher educational institutions with 112,000 students in 1918 to about 900 institutions with some 1,100,000 full-time and 400,000 extension-course students at present. During this same period, the United States doubled the number of its institutions to 1,800, and increased the students fivefold to about 2,300,000.

The proportion of Soviet graduates in scientific fields over the past 20 years has varied between 70 percent of total graduates each year and the current figure of about 44 percent, while the proportion for the United States has remained close to 30 percent. (See chart #1, p. 17)

Quantitative measures of Soviet scientific and technical manpower are provided by comparing the numbers in the USSR and the United States in the following two groups:

a. Graduates of higher educational institutions (colleges and universities) in scientific and technical fields. This includes persons with "first professional" degrees such as the M.D. and the D.D.S.

b. Persons holding advanced degrees in scientific and technical fields: the Soviet Kandidat and the American Ph.D. (including the Sc.D.). In terms of formal requirements the Kandidat is the near equivalent of the Ph.D..

Both of these groups have been broken down into three major subject categories -- physical sciences, agricultural sciences, and health sciences. (Chart #2 shows the fields which these categories include.)*

The comparisons in charts #3 and #4 indicate that, in general size and composition, Soviet scientific and technical manpower is basically similar to that of the United States. The USSR has comparable numbers of graduates of higher educational institutions and holders of advanced degrees in each of the three major subject categories.

In chart #5 a comparison of the number of persons graduating annually in scientific and technical fields in the USSR and the United States is made. The number of Soviet graduates fell off in 1933 due to a lengthening of the courses of study, and the rapid rise around 1935 was the consequence of expanded enrollments from 1930-32. Both the Soviet and US curves show wartime losses and rapid postwar increases, which reached a peak in the United States in 1950 because of the "GI Bill." Since that time, the trend has favored the Soviet Union, and present Soviet plans call for continuing increases in the number of graduates.

The quality of Soviet scientific and technical manpower has been quite uneven. The first decade and a half of the Soviet period saw a general decline in the quality of scientific education until by the early thirties, after the rapid expansion of the First Five-Year Plan, standards of research and education had fallen to low levels. Beginning in 1933, however, Soviet leaders slowed the rate of increase in numbers of students entering scientific fields and enforced higher standards of work.

Present indications are that improving educational standards and increasing experience have raised the quality of Soviet scientific and technical personnel in most major fields to approach that of the United States. Recent Soviet efforts in the theory and application of science demonstrate a high degree of competence. Current graduates in science from higher educational institutions have completed about 15 years of intensive study with a generally far greater and more consistent emphasis on scientific subjects in secondary schools than is found in the United States. In general, only more-gifted and industrious students have survived the stiff competition to enter higher schools, although nepotism and political activity can be important considerations.

* Unless otherwise apparent, the comparisons are for mid-1953. The estimates for the Soviet Union are believed accurate to within 10 percent.

TRAINING OF SOVIET SCIENTIFIC PERSONNEL

THOSE GRADUATING IN 1953 IN SCIENTIFIC FIELDS AS PERCENTAGES OF TOTAL

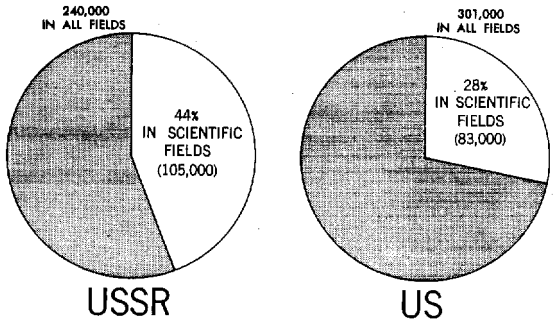

CHART 1

DEFINITIONS OF SUBJECT CATEGORIES

1. PHYSICAL SCIENCES INCLUDE:
   PHYSICS
   CHEMISTRY
   MATHEMATICS
   ENGINEERING
   GEOLOGY
   OTHER FIELDS BASED ON PHYSICS, CHEMISTRY OR THE EARTH SCIENCES
2. AGRICULTURAL SCIENCES INCLUDE:
   AGRICULTURE (AGRONOMY, ANIMAL HUSBANDRY, FORESTRY, ENTOMOLOGY, ETC.)
   BIOLOGICAL SCIENCES OTHER THAN THOSE INCLUDED UNDER "HEALTH SCIENCES"
3. HEALTH SCIENCES INCLUDE:
   MEDICINE AND MEDICAL SCIENCES
   DENTISTRY AND DENTAL SCIENCES
   OTHER FIELDS SUPPORTING HEALTH AND SANITATION (EXCLUDING NURSING UNLESS BASED ON 4-YEAR CURRICULA)
   BIOLOGICAL SCIENCES OTHER THAN THOSE INCLUDED UNDER "AGRICULTURAL SCIENCES"

CHART 2

NUMBERS OF GRADUATES EMPLOYED IN THE MAJOR SCIENTIFIC FIELDS

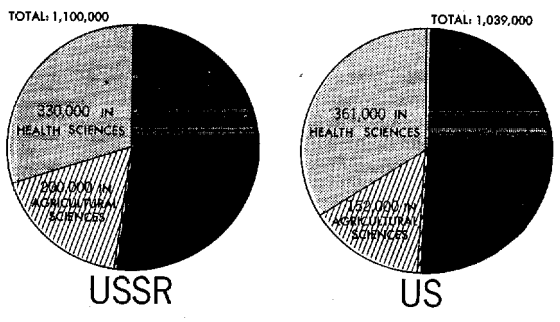

CHART 3

NUMBERS OF PERSONS HOLDING ADVANCED DEGREES IN SCIENTIFIC FIELDS

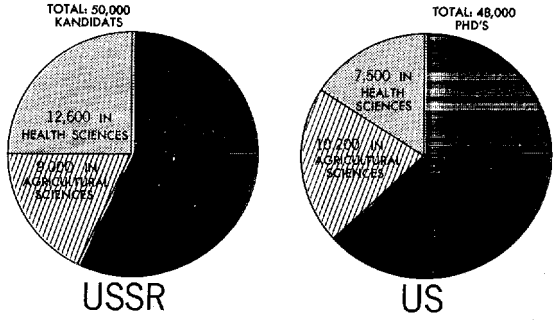

CHART 4

NUMBERS OF GRADUATES PER YEAR IN ALL SCIENTIFIC FIELDS

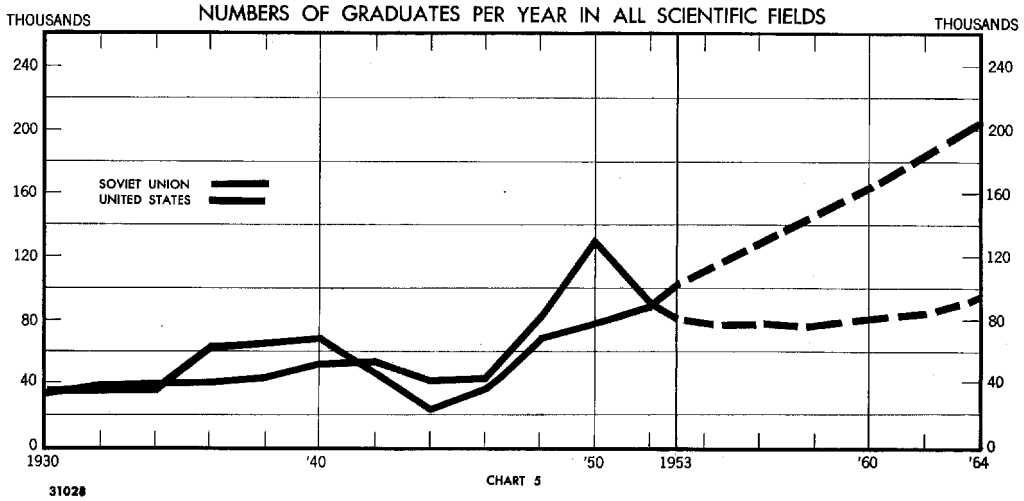

CHART 5

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